

What is claimed is:

1. A process for producing precipitated calcium carbonate, comprising the steps of:
 - (a) providing calcium hydroxide; and
 - 5 (b) carbonating the calcium hydroxide with carbon dioxide gas and comminuting for a time sufficient to produce a calcium carbonate having at least about a 90 weight percent conversion to calcium carbonate and having a solids concentration of at least about 90 weight percent.
- 10 2. The process according to claim 1, wherein the calcium hydroxide provided is at least about 90 weight percent solids with water present in an amount of up to about 10 weight percent.
- 15 3. The process according to claim 2, wherein the calcium hydroxide provided is about 92 weight percent solids.
- 20 4. The process for producing precipitated calcium carbonate according to claim 1, wherein the calcium hydroxide provided in step (a) is produced by the steps comprising:
 - i) mixing calcium oxide and water in amounts sufficient to react to form calcium hydroxide substantially free of water; and
 - ii) maintaining the mixture at an elevated temperature for a time sufficient to hydrate the calcium oxide to form calcium hydroxide having at least about 90 weight percent solids and water present in an amount of up to about 10 weight percent.

5. The process according to claim 4, wherein the step of maintaining the mixture at an elevated temperature is performed at a temperature of up to about 600 degrees Fahrenheit for a time sufficient to hydrate the calcium oxide to form calcium hydroxide having at least about a 95 weight percent conversion to calcium hydroxide.

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6. The process according to claim 5, wherein the step of maintaining the mixture at an elevated temperature is performed for a time sufficient to hydrate the calcium oxide to form calcium hydroxide having at least about a 98 weight percent conversion to calcium hydroxide.

10 7. The process according to claim 1, wherein the steps of carbonating and comminuting are performed until at least a 95 weight percent conversion to calcium carbonate is achieved.

8. The process according to claim 1, wherein the steps of carbonating and comminuting are performed until at least a 97 weight percent conversion to calcium carbonate is achieved.

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9. A process for producing precipitated calcium carbonate, comprising the steps of:

- (a) providing calcium hydroxide;
- (b) carbonating the calcium hydroxide with carbon dioxide gas for a time sufficient to at least partially convert the calcium hydroxide to calcium carbonate;
- (c) comminuting the at least partially converted calcium hydroxide; and
- (d) sequentially repeating steps of carbonating and comminuting for a time sufficient to substantially convert the calcium hydroxide to calcium carbonate having at least about a 90

weight percent conversion to calcium carbonate and having a solids concentration of at least about 90 weight percent.

10. The process according to claim 9, wherein the calcium hydroxide provided is at least about
5 90 weight percent solids with water present in an amount of up to about 10 weight percent.

11. The process according to claim 10, wherein the calcium hydroxide provided is about 92 weight percent solids.

10 12. The process for producing precipitated calcium carbonate according to claim 9, wherein the calcium hydroxide provided in step (a) is produced by the steps comprising:
i) mixing calcium oxide and water in amounts sufficient to react to form calcium hydroxide substantially free of water; and
ii) maintaining the mixture at an elevated temperature for a time sufficient to hydrate the calcium
15 oxide to form calcium hydroxide having at least about 90 weight percent solids and water present in an amount of up to about 10 weight percent.

13. The process according to claim 12, wherein the step of maintaining the mixture at an elevated temperature is performed at a temperature of up to about 600 degrees Fahrenheit for a time sufficient to hydrate the calcium oxide to form calcium hydroxide having at least about a 95 weight percent conversion to calcium hydroxide.
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14. The process according to claim 13, wherein the step of maintaining the mixture at an elevated temperature is performed for a time sufficient to hydrate the calcium oxide to form calcium hydroxide having at least about a 98 weight percent conversion to calcium hydroxide.
- 5 15. The process according to claim 9, wherein the steps of carbonating and comminuting are performed until at least a 95 weight percent conversion to calcium carbonate is achieved.
16. The process according to claim 15, wherein the steps of carbonating and comminuting are performed until at least a 97 weight percent conversion to calcium carbonate is achieved.
- 10 17. The calcium carbonate product produced-by-the-process of claim 1.
18. The calcium carbonate product produced-by-the-process of claim 4.
- 15 19. The calcium carbonate product produced-by-the-process of claim 9.
20. The calcium carbonate product produced-by-the-process of claim 12.

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